Solar eclipse of July 11, 2010

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Main page
Contents
Current events
Random article
About Wikipedia
Contact us
Donate

Contribute
Help
Learn to edit
Community portal
Recent changes
Upload file

Tools
What links here
Related changes
Special pages
Permanent link
Page information
Cite this page
Wikidata item

Print/export
Download as PDF
Printable version

In other projects
Wikimedia Commons

Languages
Deutsch
Español
Français
한국어
Bahasa Indonesia
Italiano
Português
Русский
中文
8 more
Edit links

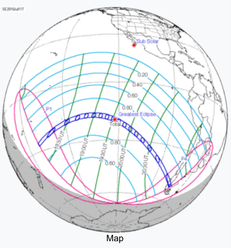
The total **solar eclipse of July 11, 2010**, occurred over the southern Pacific Ocean.[1] A solar eclipse occurs when the Moon passes between Earth and the Sun, thereby totally or partly obscuring the image of the Sun for a viewer on Earth. A total solar eclipse occurs when the Moon's apparent diameter is larger than the Sun's, blocking all direct sunlight, turning day into darkness. Totality occurs in a narrow path across Earth's surface, with the partial solar eclipse visible over a surrounding region thousands of kilometres wide. This eclipse was on the same day as the 2010 FIFA World Cup Final.

Contents [hide]

1 Visibility
2 Observations
3 Related eclipses
3.1 Eclipses of 2010
3.2 Eclipses cycles
3.3 Solar eclipses 2008–2011
3.4 Saros 146
3.5 Metonic series
4 Notes
5 References

Solar eclipse of July 11, 2010

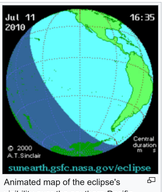
Totality from Hao, French Polynesia



Map

Type of eclipse	
Nature	Total
Gamma	-0.6788
Magnitude	1.058
Maximum eclipse	
Duration	320 sec (5 m 20 s)
Coordinates	19.7°S 121.9°W
Max. width of band	259 km (161 mi)
Times (UTC)	
(P1) Partial begin	17:09:41
(U1) Total begin	18:15:15
Greatest eclipse	19:34:38
(U4) Total end	20:51:42
(P4) Partial end	21:57:16
References	
Saros	146 (27 of 76)
Catalog # (SE5000)	9530

Visibility [edit source]



Animated map of the eclipse's visibility over the southern Pacific Ocean

The eclipse on this day was one of the most remote in recorded history. It was visible over much of the southern Pacific Ocean, touching several atolls in French Polynesia, the Cook Islands, Easter Island, and Argentina's Patagonian plains.[2]

Fred Espenak, a NASA astrophysicist, said:

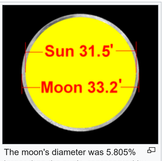
> "One of the most unique things about this particular eclipse is that it crosses a unique and interesting archaeological site: Easter Island. On Easter Island there are these great statues... There's a lot of mystery about these statues, but in any case, this is the first total eclipse to hit the island in about 1,400 years."[3]

In French Polynesia, the eclipse was seen with 98 percent totality. During that time, the diamond ring effect and the Baily's beads occurred.

It ended at sunset over the southern tips of Argentina and Chile in South America, including the town of El Calafate. The Sun's altitude was only 1° during the 2 minute 47 second total phase, but Argentino Lake offered an adequate line-of-sight to the eclipse hanging just above the rugged Andes skyline.[1]

A 58% partiality occurred at sunset in Santiago, Chile, but it was not visible due to adverse weather conditions. In other cities such as Valparaíso and Coquimbo, clearer skies permitted the event to be witnessed in continental Chile.

Observations [edit source]



The moon's diameter was 5.805% larger than the sun's, represented by the magnitude of eclipse of the table above, making for a relatively long eclipse duration of 5 minutes, 20.24 seconds.

Total eclipse began 750 kilometers (470 mi) southeast of Tonga at approximately 18:15 UTC and reached Easter Island by 20:11 UTC.[4] The global sky photography project The World At Night stationed photographers throughout the eclipse's visibility track. Eclipse chasers photographed the event on board a chartered airplane,[5] cruise ships, numerous Pacific islands, and in Argentina's Patagonia region. Totality was observed for four minutes and 41 seconds (4:41) on Easter Island,[2] where it was observed for the first time in 1,400 years.[6] Approximately 4,000 observers visited Easter Island for this eclipse, including tourists, scientists, photographers, filmmakers and journalists,[7] prompting an increase in security at its important moai archeological sites. The eclipse occurred at the same time that the final game of the 2010 FIFA World Cup was being played in South Africa, and many soccer fans in Tahiti watched the match instead of observing the partial eclipse with a high percentage of obscuring the sun by over 98%.[4][8] The path of totality of this eclipse barely missed some significant inhabited islands, including passing just about 20 km north of the northern end of Tahiti.[*citation needed*]

Time lapse images of the eclipse as seen from Viña del Mar, Chile

This eclipse was the first one to happen over French Polynesia in 350 years. An estimated 5,000 tourists visited various islands in the archipelago to observe the event. Nearly 120,000 pairs of special glasses were distributed for observers.[9] Eclipse chasers were also able to observe the eclipse at El Calafate, near the southern tip of Argentina, before the sun set just two minutes later.[2]

Several hours after the eclipse was observed in continental Chile, a magnitude 6.2 earthquake struck in the Antofagasta Region. There were no major injuries or damage in the nearby cities of Calama, Chile and San Pedro de Atacama.[10]

Related eclipses [edit source]

Eclipses of 2010 [edit source]

- An annular solar eclipse on January 15.
- A partial lunar eclipse on June 26.
- A total solar eclipse on July 11.
- A total lunar eclipse on December 21.

Eclipses cycles [edit source]

- It was preceded two weeks earlier by the partial lunar eclipse on June 26, 2010.
- In Saros cycle 146, this eclipse repeats every 18 years 11 days, previously on total solar eclipse of June 30, 1992 and next on total solar eclipse of July 22, 2028.
- In a tzolkinex cycle, it repeats every 7 years 1 month 1 days, previous as the annular solar eclipse of May 31, 2003 and followed by the total solar eclipse of August 21, 2017.
- In a tritos cycle, it repeats every 10 years 11 months, previous as the total solar eclipse of August 11, 1999 and followed by the annular solar eclipse of June 10, 2021.
- In an inex cycle, it repeats every 29 years minus 20 days, previous as the total solar eclipse of July 31, 1981 and followed by the annular solar eclipse of June 21, 2039.
- The next total solar eclipse will occur on November 13, 2012. The path of totality ends about 500 km west of Chile but the eclipse will be partial on sundown from the coast, and 2000 km east of New Zealand.

Solar eclipses 2008–2011 [edit source]

This eclipse is a member of a semester series. An eclipse in a semester series of solar eclipses repeats approximately every 177 days and 4 hours (a semester) at alternating nodes of the Moon's orbit.[11]

Solar eclipse series sets from 2008–2011 [show]

Saros 146 [edit source]

It is a part of Saros cycle 146, repeating every 18 years, 11 days, containing 76 events. The series started with partial solar eclipse on September 19, 1541. It contains total eclipses from May 29, 1938 through October 7, 2154, hybrid eclipses from October 17, 2172 through November 20, 2226, and annular eclipses from December 1, 2244 through August 10, 2659. The series ends at member 76 as a partial eclipse on December 29, 2893. The longest duration of totality was 5 minutes, 21 seconds on June 30, 1992.

Series members 21-37 occur between 1901 and 2200: [show]

Metonic series [edit source]

The metonic series repeats eclipses every 19 years (6939.69 days), lasting about 5 cycles. Eclipses occur in nearly the same calendar date. In addition, the octon subseries repeats 1/5 of that or every 3.8 years (1387.94 days). All eclipses in this table occur at the Moon's descending node.

21 eclipse events, progressing from north to south between July 11, 1953 and July 11, 2029 [show]

Notes [edit source]

1. ^ a b "Total Solar Eclipse of 2010 July 11". NASA. Archived from the original on March 11, 2008. Retrieved July 12, 2010.
2. ^ a b c Malik, Tariq (July 12, 2010). "Total solar eclipse blots out sun, amazes skywatchers". *The Christian Science Monitor*. Retrieved July 12, 2010.
3. ^ "Solar Eclipse to Darken Easter Island Sunday". National Geographic Society. July 8, 2010. Retrieved July 12, 2010.
4. ^ a b "Total solar eclipse crosses South Pacific". BBC News. July 11, 2010. Retrieved July 12, 2010.
5. ^ Grossman, Lisa (July 22, 2010). "Longest Eclipse Ever: Airplane Chases the Moon's Shadow". Wired. Retrieved August 21, 2017.
6. ^ "Solar Eclipse to Darken Easter Island Sunday" . *National Geographic*. July 8, 2010. Retrieved October 28, 2020.
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8. ^ Tee, Gillian (July 10, 2010). "Solar eclipse predicted at same time as World Cup final". CNN. Retrieved July 12, 2010.
9. ^ "French Polynesia awaits first solar eclipse in 350 years". Australia Network. July 10, 2010. Archived from the original on July 13, 2010. Retrieved July 12, 2010.
10. ^ "6.2 Magnitude Earthquake Strikes Chile Hours After Solar Eclipse". All Headline News. July 12, 2010. Archived from the original on July 14, 2010. Retrieved July 12, 2010.
11. ^ van Gent, R.H. "Solar- and Lunar-Eclipse Predictions from Antiquity to the Present". *A Catalogue of Eclipse Cycles*. Utrecht University. Retrieved 6 October 2018.

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  - NASA homepage for July 11 2010 total solar eclipse
  - NASA: Eclipses During 2010: Total Solar Eclipse of July 11
- Eclipser: 2010 July 11 Total Solar Eclipse
- Eclipse.org.uk: Total Eclipse of the Sun: 2010 July 11
- www.spaceweather.com
- Easter Island Eclipse, APOD 7/14/2010
- Andes Sunset Eclipse, APOD 7/15/2010, totality from 400 meters above Argentino Lake
- The Crown of the Sun, APOD 7/21/2010, totality from Easter Island
- Diamond Ring and Shadow Bands, APOD 7/24/2010, totality from Hao, French Polynesia
- Eclipse on the Beach, APOD 7/30/2010, totality from Anakena Beach, Easter Island
- Eclipse Shadow Cone Over Patagonia, APOD 8/4/2010, totality from Patagonia, Argentina

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V · T · E **Solar eclipses** [show]

Categories: Total solar eclipses | 2010 in science | 21st-century solar eclipses | History of the Pacific Ocean | July 2010 events | 2010 in Argentina | 2010 in Chile

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